SANDPOINT FISH HATCHERY

ANNUAL REPORT

January 1, 1991 - December 31, 1991

Prepared by:

Scott Patterson, Fish Hatchery Superintendent I

INTRODUCTION

The Sandpoint Hatchery is located in Bonner County on the south bank of the Pend Oreille River approximately two miles south of Sandpoint. Sandpoint Hatchery was closed in 1985 due to high fish production cost, but was reopened in 1990 because of public demand. The primary duties of the Sandpoint Hatchery include interacting with public sportsmens groups, developing bull trout culture techniques, managing Pend Oreille Lake net pens, managing a small-scale specialty hatchery, and operating or assisting in area egg-taking programs (Figure 1).

The hatchery is primarily license-funded, with an annual operating budget of approximately $18,000. An additional $2,100 was funded in 1991 by BPA to raise sturgeon. The local community contributed over $6,000 in funds and services.

The hatchery is staffed with one Hatchery Superintendent I and an 8-month laborer position.

Water Supply

The hatchery rearing water consists of 500-600 gpm at a temperature of 7°C from Murphy Springs #3. Springs #1, #2, and #4 have not been fully developed. The hatchery flow fluctuates with seasonal precipitation, with reductions in late summer and increases in early spring.

The entire hatchery water right is 4 cfs from Murphy Springs. The Idaho Department of Fish and Game was deeded the springs in 1928, but not the surrounding land. An easement agreement was made which states that the Idaho Department of Fish and Game will provide a 2-inch domestic line to a private residence for a reservoir right-of-way and pipeline right-of-way from the spring to the hatchery.

The rights to Spring #2 has been waived to the South Side Sewer District in the amount of 300 gpm. This water can be reclaimed for hatchery use if needed.

Rearing Facilities

The hatchery rearing facilities include 8 Heath incubators (8-tray), 18 cement vats (13 ft x 2.5 ft x 3 ft), and 2 reuse raceways (100 ft x 5 ft x 2 ft). The buildings consist of one nursery/shop/office complex, one storage shed, garage/crew quarters, and a residence. Other hatchery facilities include two portable weir fish traps, six net pens and frames, and two Lake Merwin traps (Figure 2).

SANDPT91

FISH PRODUCTION

The Sandpoint Hatchery produced 6,660 pounds of fish from 12,595 pounds of feed (1.89 conversion). The costs of production were estimated at $7.91 per pound and $43 per thousand fish (Table 1). Six species of salmonids (rainbow trout, westslope cutthroat trout, bull trout, lake trout, kokanee salmon, chinook salmon) and one species of Acipenser (white sturgeon) were produced in 1991 for statewide distribution.

The Sandpoint Hatchery started the 1991 production year with 133,060 fish weighing 4,197 pounds (Table 2). A total of 983,150 (2,327 pounds) fish and eggs were received with 412,910 eggs spawned during the production year (Table 3). The Sandpoint Hatchery ended the year with 589,420 fish weighing 4,914 pounds (Table 4).

HATCHERY IMPROVEMENTS

The community contributed funds and services for many hatchery improvements. These services included roadway and parking lot excavation and plumbing repairs (office/shop/hatchery building water line). The funds included an informational center, fence, and belt feeders.

The Bonneville Power Administration funded hatchery improvements to raise white sturgeon. They funded a recirculating heating system inside the hatchery, plumbing for a lake heat exchanger, and outside electrical outlets. This money was provided in conjunction with the Kootenai River sturgeon project.

Hatchery improvements funded by license dollars included hatchery crew quarters, new vinyl flooring and a stove in the resident house, snow blower, lawn tractor, weed eater, and trash pump.

The most significant need for hatchery operations is a new 4 x 4 pick-up truck. Other items needed include office furniture, a refrigerator, a replacement belt feeder and hatching trays, and an upgraded temporary position to bio-aide.

FISH HEALTH

Department personnel from the Eagle Fish Health Laboratory conducted health inspections on production fish and broodstock (Table 6). The overall health of hatchery fish was good. All hatchery-produced fish were clean of obligate pathogens; however, BKD was detected by ELISA testing in net pen-reared cutthroat (Red Fir) and Coeur d'Alene fall chinook broodstock. The positive cutthroat trout were transferred from the Clark Fork Hatchery. The Clark Fork Hatchery cutthroat are typically carriers of BKD. The Coeur d'Alene fall chinook tested negative with the FAT test.

A diagnostic inspection of Washoe, Montana westslope cutthroat trout (received from Cabinet Gorge) revealed facultative pathogens Aeromonad and Pseudomonad. The fish were "sick" at arrival. Fish were treated with oxolinic acid (0.5 g/100 pounds of fish). Mortality dropped after treatment, but these fish have never regained a "normal" behavior.

FISH STOCKED AND TRANSFERRED

A total of 404,760 fish (8,270 pounds) were stocked or transferred by the Sandpoint Hatchery (Table 5). The cutthroat trout reared in net pens provided the majority of the pounds stocked (3,862). The Coeur d'Alene kokanee stocked in Region 1 lowland lakes and Lucky Peak Reservoir provided the majority of the numbers stocked (254,130). The balance consists of transfers of 8,200 (250 lbs) cutthroat, 13,140 (137 lbs) bull trout, 38,670 (430 lbs) kokanee, 5,250 (66 lbs) rainbow, 200 (2.5 lbs) sturgeon, and 15,050 green kokanee eggs to Cabinet Gorge Hatchery; 1,000 (9 lbs) kokanee to Kootenai Hatchery; 2,025 (540 lbs) cutthroat to Clark Fork Hatchery; 15,400 (2,305 lbs) cutthroat to Sawtooth Hatchery; and 2,050 (6 lbs) bull trout to the University of Idaho. Lake trout (775) were used for a catch-out pond at the Sandpoint City Beach.

The Sandpoint Hatchery will not rear kokanee for stocking Region 1 lowland lakes in 1992, nor capture bull trout for egg collections. New programs for Sandpoint will include sturgeon culture, hatching 500,000 rainbow trout eggs for transfer to the Nampa Hatchery, and an experimental captive broodstock program with Pend Oreille Kokanee.

FISH SPAWNING

The Sandpoint Hatchery is responsible for two egg-taking programs: fall chinook and late kokanee on Coeur d'Alene Lake. The fall chinook are collected in September and October, and the kokanee are collected in November and December. Equipment for the weirs and traps are stored at the Region 1 office. Regional personnel helped with the deployment and removal of the weirs and traps. The Sandpoint Hatchery objectives were egg collections. Dates for deployment and removal are set by Regional Fish Managers.

Chinook

The Coeur d'Alene River and Wolf Lodge Creek weirs were deployed August 15 and August 23, respectively, and removed November 11 and November 8. The first fish were spawned September 13. Only fish trapped before October 1 were used for broodstock. A total of 207 fish were trapped producing 397,890 green eggs. The eggs were spawned from 81 females from the Wolf Lodge Creek trap (Table 7). Seven fish were trapped from the Coeur d'Alene River. The Coeur d'Alene River

trap is virtually non-effective. When the fish encounter the weir, they drop back and spawn in the ripples below.

Eggs are fertilized at the Sandpoint Hatchery using a delayed fertilization technique. Broodstock selection was based on fish entering the trap prior to October 1. Adults were crossed (2 x 2 or 3 x 3) using a random selection. Eggs were enumerated by weight.

Sixty-two percent of the green eggs eyed. From the 245,500 eyed eggs, 13,875 eggs were shipped to Mackay on November 13. Because of the BKD certification as determined by the ELISA method, the remaining embryos were destroyed. All fish spawned were represented in the shipment. Ovarian and tissue samples were sent to Eagle Lab for disease diagnostic work.

Kokanee

The Coeur d'Alene Lake Merwin traps were deployed November 5 and 6 in Beauty Bay and along Highway 1-90 and removed December 17. Traps were fished in four sites in the Wolf Lodge arm of the lake using four throat attachments during this time period. Different locations and throat settings were tried in an effort to collect more fish, but were unsuccessful.

A total of 15,050 eggs were spawned from 50 females for an average fecundity of 301. Spawning efficiency was not estimated this year. The number of kokanee trapped follows an inverse trend of the number of chinook trapped over the past four years (Figure 2).

Disease samples were taken December 8 by Eagle Fish Health personnel, and eggs collected were donated to the sockeye program.

FISH FEED

The primary feed source for the Sandpoint Hatchery is Bioproducts, Inc. in Warrenton, Oregon. Biodry 4000 appears to be the best suitable diet for westslope cutthroat trout (J. Thorpe, personal communication, 1991). Since the majority of the hatchery production comes from the net-penned cutthroat, most of the feed is ordered from Bioproducts to reduce shipping cost.

Oregon Moist Pellet (OMP) is fed primarily to the kokanee. The OMP IV appears to be the most cost effective diet for kokanee (J. Chapman, personal communication, 1991). Excess feed from Cabinet Gorge Hatchery was used to feed kokanee fry in 1991.

Biokyowa was used to start the Kootenai River sturgeon. After starting, the sturgeon were switched to Rangen semi-moist for grow-out. The Biokyowa and Rangen diet regime is the most acceptable method of feeding sturgeon (J. Siple, personal communication, 1991).

SANDPT91

Feed cost at Sandpoint Hatchery was $1,650.20 from license funding. The majority of the feed used in 1991 was excess Cabinet Gorge feed (500 lbs) or was purchased ($2,900.00) by the Sandpoint community.

PUBLIC RELATIONS

Approximately 3,000 people toured the Sandpoint Hatchery this past year. Tourists included the general public and various forestry, fish, school, and scout groups. Most tourists left with an excellent opinion of the Idaho Department of Fish and Game. Good relations were maintained with Trout Unlimited and Lake Pend Oreille Idaho Club. Sandpoint personnel manned a display booth for Trout Unlimited's spring banquet and gave multiple presentations to Lake Pend Oreille Idaho Club banquets. Both groups will continue to fund the net pen program.

Television coverage, radio commentaries, articles, and photos featured the Sandpoint Hatchery. Sandpoint Hatchery personnel were monthly features in the local media "Speak Up North Idaho" radio show and an outdoor column newspaper (Sandpoint Daily Bee).

A new fishery at the Sandpoint Beach was made popular by approximately 100 kids and their parents. Kids under six years old were allowed to catch excess lake trout from a 1,000-gallon stock tank.

SPECIAL PROJECTS

Bull Trout

The development of bull trout culture techniques was a primary goal of the Sandpoint Hatchery. This goal has been achieved with very little changes, if any, to other salmonid culture techniques. It is apparent that the collection of ripe adults is the priority. Male bull trout will not ripen after collection, and a female's egg quality is negatively influenced by holding time. Bull trout will enter the Cabinet Gorge fish ladder providing that cold water (less than 7°C) is available. Adult returns will vary from year to year. The run has ranged from 10 to 25 fish since 1987 to 1990. After hatching, culture techniques are similar to wild brown trout, i.e., feed training in shallow water, overhead cover, and dark containers. Low densities appear to speed growth and survival after feed training. Fish survival to 3.5-inch fry is 75% (Table 8). Adult bull trout were not spawned in 1991, nor will they be spawned in 1992.

SANDPT91

Kokanee Sterilization

Heat-shocked kokanee were reared at Sandpoint Hatchery after incubation at Cabinet Gorge Hatchery in 1990. From 14,880 sac-fry (27.7% eye-up), 5,430 fish were released. Induction rates were estimated at 77.4% with a flow cytometer. The flow cytometery was done at Washington State University. Personnel at the Sandpoint Hatchery observed that the triploid fish did not grow as fast as the diploid fish in the population. The population grew in a bi-modal length frequency with the diploid fish growing faster (Figure 3). Apparently, the triploid fish have a different Standard Environmental Temperature than diploid, or the larger size of the triploid red blood cells effects respiration processes.

Sturgeon

Sturgeon were experimentally cultured at the Sandpoint Hatchery. A passive heat exchange system was installed to heat hatchery water using the lake as the heating source. The lake heat exchanger was able to raise the water temperature of 10 gpm a total of 8°C. The lake will provide a heating source between May and September. A recirculating (active) heating system was installed to raise the fish during the winter months.

Approximately 3,500 sac fry sturgeon were transferred from the Kootenai Hatchery. The highest mortality occurred from non-feeders, but point sources (change in feed size, disturbance, etc.) of mortality could also be determined (Figure 4). Twenty percent of the fish have survived to a 4-inch fingerling stage.

Fish Marking

Three hundred net-penned cutthroat were floy-tagged with **a** five dollar reward. Fifty fish from each pen were floy-tagged. All cutthroat reared in net pens are marked with an adipose fin clip prior to loading.

Brood kokanee

An experimental captive broodstock program has been started at Sandpoint Hatchery. Approximately 7,000 will be held until maturity. Fish will be examined for fat content and gonad development. No age 1+ females are mature.

SANDPT91

Table 1. Sandpoint Hatchery production summay, 1991.

	Numbers	Weight gain (1991)	Total feed fed (1991)	Conversion	Production Cost	Cost/ lb gained	Cost/1000 fish or egg
Totals	1,225,680	6,659	12,595	1.89	52,700*	7.91	43.00

*Cost equals one-half the 1990-91 year plus one-half the 1991-92 year. Costs do not include capital outlay items.

Table 2. Fish at the Sandpoint Hatchery, January 1, 1991.

Species	Stock	Numbers	Weight pound	Length	Fish/ Pound
Cutthroat	89-Mon-C2	13,900	1,600	6.8	9
Cutthroat	90-Mon-C2	21,340	74	2.1	288
Cutthroat*	89-IdCF-C2	34,870	2,342	5.8	15
Kokanee	90-IdSS-KL	7,700	128	3.8	60
Mackinaw	90-Ut-Ma	750	53	6.5	15
Bull trout	91-IdCF-Bu	23,200			
Bull trout	91-IdGC-Bu	31,300			
Totals		133,060	4,197		

Table 3. Fish and eggs received and eggs collected in 1991.

Species	Stock	Numbers	Weight pounds	Length	Fish/ pound	Receiveing status	Source
Cutthroat	91-Mon-C2	24,000	5	0.83	4,700	sac fry	Cabinet Gorge
Cutthroat	90-IdCF-C2	60,000	1,938	4.50	31	fingerling	Clark Fork
Kokanee	91-IdCdA-KL	310,000	48	0.80	6,500	swim-up	Cabinet Gorge
Kokanee	91-IdSS-KL	52,700	158	2.20	334	fry	Cabinet Gorge
Rainbow	91-BC-K2	5,250	66	3.30	79	fry	Cabinet Gorge
Rainbow	91-BC-K2 (slow)	5,700	1	0.85	4,700	eyed-egg	British Columbia
Rainbow	91-Wa-K2	517,000	110	0.85	4,700	eyed-egg	Gloyd Springs
RC hybrid	91-Id-RC	5,000	1	0.83	5,000	eyed-egg	Henrys Lake
Sturgeon	91-IdK-St	3,500		0.70	11,000	sac fry	Kootenai
Fall chinook	91-IdCdA-FC	397,890				green eggs	Coeur d'Alene
Kokanee	91-IdCdA-KL	15,050				green eggs	Coeur d'Alene
Totals		1,396,090	2,327				

Table 4. Fish on hand at the Sandpoint Hatchery, December 31, 1991.

Species	Stock	Numbers	Current weight	Weight gain (1991)	Length	Fish/ pound	Total feed fed (1991)	Conver- sion	Prod. cost	Cost/lb gained	Cost/1000 fish or egg
Kokanee	90-IdSS-KL	7,105	1,323	1,140	8.50	5.37	1,581	1.39	1,054	0.92	148.35
Kokanee	91-IdSs-KL	12,945	275	236	4.12	47	378	1.60	1,054	4.47	81.42
Rainbow	91-BC-K2	5,180	30	28	2.51	172	52	2.34	1,054	37.64	203.47
Rainbow	91-Wa-K2	450,000	110	0	0.85	4,086	0	na	1,054	na	2.34
RC hybrid	91-Id-RC	4,090	24	23	2.52	172	48	2.53	1,054	45.82	257.70
Bull trout	91-IdGC-BU	14,000	187	182	3.75	75	222	1.22	1,054	5.79	75.29
Bull trout	91-IdCF-BU	17,500	179	172	3.45	98	331	1.58	1,054	6.13	60.23
Cutthroat	90-Non-C2	8,700	348	294	4.85	25	555	1.89	1,054	3.59	121.15
Cutthroat	91-Non-C2	14,400	37	30	1.95	385	76	2.27	1,054	35.13	73.19
Cutthroat*	90-Id-C2	55,000	2,391	453	5.00	23	900	1.99	3,952	8.72	71.85
Sturgeon	91-IdKR-ST	500	10	10	4.60	51	30	2.98	2,635	263.50	5,270.00
Totals		589,420	4,914	2,568			4,173	1.63	16,073	6.26	27.27

*Net pens
**Cost equals one-half the 1990-91 year plus one-half the 1991-92 year.
Costs do not include capital outlay items.

Table 5. Fish released or transferred from Sandpoint Hatchery, 1991.

Species	Stock	Numbers	Pounds shipped	Weight gain (1991)	Length	Fish/ pound	Total feed fed (1991)	Conver- sion	Prod. cost	Cost/lb gained	Cost/1000 fish or eqq
Bull trout	91-IdGC-BU	15,190	143	141	3.35	106.0	179	1.27	1,054	7.48	69.39
Chinook	91-IdCA-FC	245,500	8	139	na	1,770.0	na	na	10,540	75.83	42.93
Cutthroat	89-Mon-C2	12,375	2,790	846	8.60	4.4	1,730	1.30	1,054	1.25	85.17
Cutthroat*	89-Id-C2	34,870	3,862	1,718	6.70	9.4	4,800	2.79	3,953	2.30	113.36
Cutthroat	90-Mon-C2	13,250	305	303	4.03	43.4	445	1.46	1,054	3.48	79.55
Kokanee	91-IdSS-KL	39,670	439	310	3.30	90.0	492	1.60	1,054	3.40	26.57
Kokanee	91-IdCd-KL	254,130	531	499	1.91	479.0	580	1.16	1,054	2.11	4.15
Kokanee	92-IdCA-KL	15,050	2	2	.80	6,356.0	na	na	12,121	6,060.50	805.38
Lake trout	90-Ut-LA	775	121	86	8.00	6.4	124	1.44	1,054	12.25	1,360.00
Rainbow	91-BC-K2	5,250	66	44	3.30	79.0	65	1.49	1,054	23.95	200.76
Sturgeon	91-IdKR-ST	200	3	3	4.00	80.0	7	2.98	2,635	878.33	13,175.00
Subtotals		636,260	8,270	4.091			8,422	2.06	36,627	8.96	57.56

Table 6. Eagle Fish Health Lab testing summary for 1991.

Brood year	Stock	Species	Log	Date	VH	VP	VE	BK	BF	BR	BC	PX	PW	PC
1990	CFR	Bull	91-29	2-12					-	-				
			91-125	5-1	-	-	-							
1990	GC	Bull	91-30	1-12					-	-				
1989	WS	Cutthroat	91-124	5-1	-	-			-	-	+			
1991	WS	Cutthroat	91-214	7-22	-	-			-	-	-			
Brood	WLC	FC	91-277	9-13	-	-		+						
			91-289	9-19	-	-		+						
Brood	CdA	KL (kok)	91-368	12-5	-	-		-					-	-

VH = IHNV
VP = IPNV
VE = EIBS
BK = Bacterial Kidney Disease
BR = Enteric Red Mouth
BC = Bacterial Coldwater Disease
BF = Bacterial Furunculosis
PW = Whirling Disease agent
PX = Proliferative Kidney Disease agent
PC = Ceratomyxosis agent

Table 7. Coeur d'Alene fall chinook spawning summary, 1991.

Spawning date	Spawning site	Females spawned	Eggs collected	Percent eye-up	Spawning fecundity	Average fork (cm) length
13-Sep	WLC	4	14,080	58.5	3,520	75.7
16-Sep	WLC	12	53,800	70.1	4,480	76.5
19-Sep	WLC	23	102,210	67.7	4,440	77.3
23-Sep	WLC	27	156,750	61.2	5,810	81.4
26-Sep	WLC	15	71,050	55.0	4,740	84.8
Totals		81	397,890	61.7	4,910	79.9

Table 8. Bull trout survival data, 1990-91.

	Green eggs	Eyed eggs	Swim-up fry	Fry (3.2")
Number	64,090	54,500	51,000	46,690
Green egg survival to:		0.85	0.80	0.73
Eyed egg survival to:			0.94	0.96
Swim-up fry survival to:				0.92

Sandpoint Hatchery
Time allocation, 1991

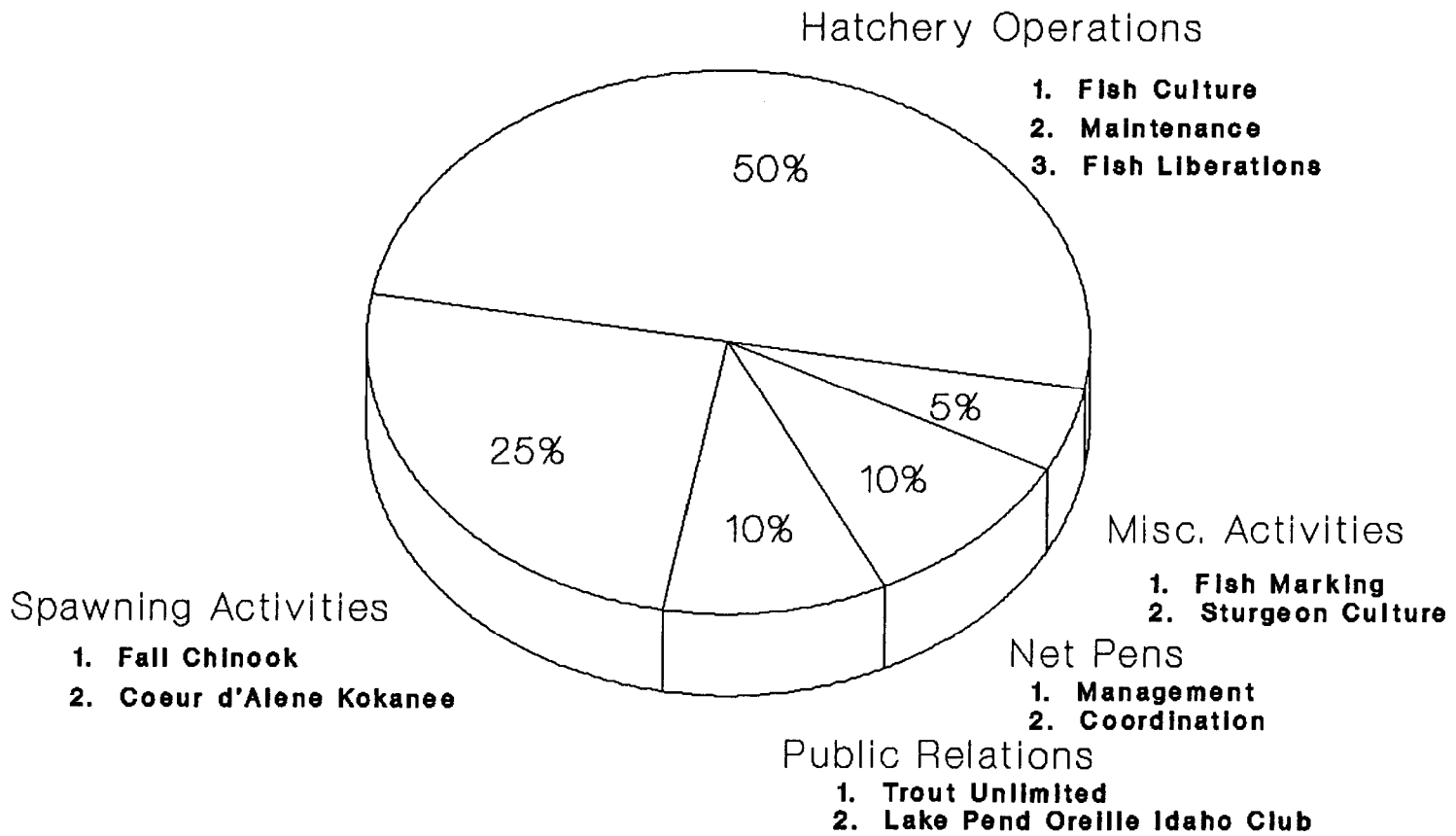

Fig. 1. Sandpoint time allocation 1991.

Sandpoint Hatchery

Chinook and Kokanee spawning trends.

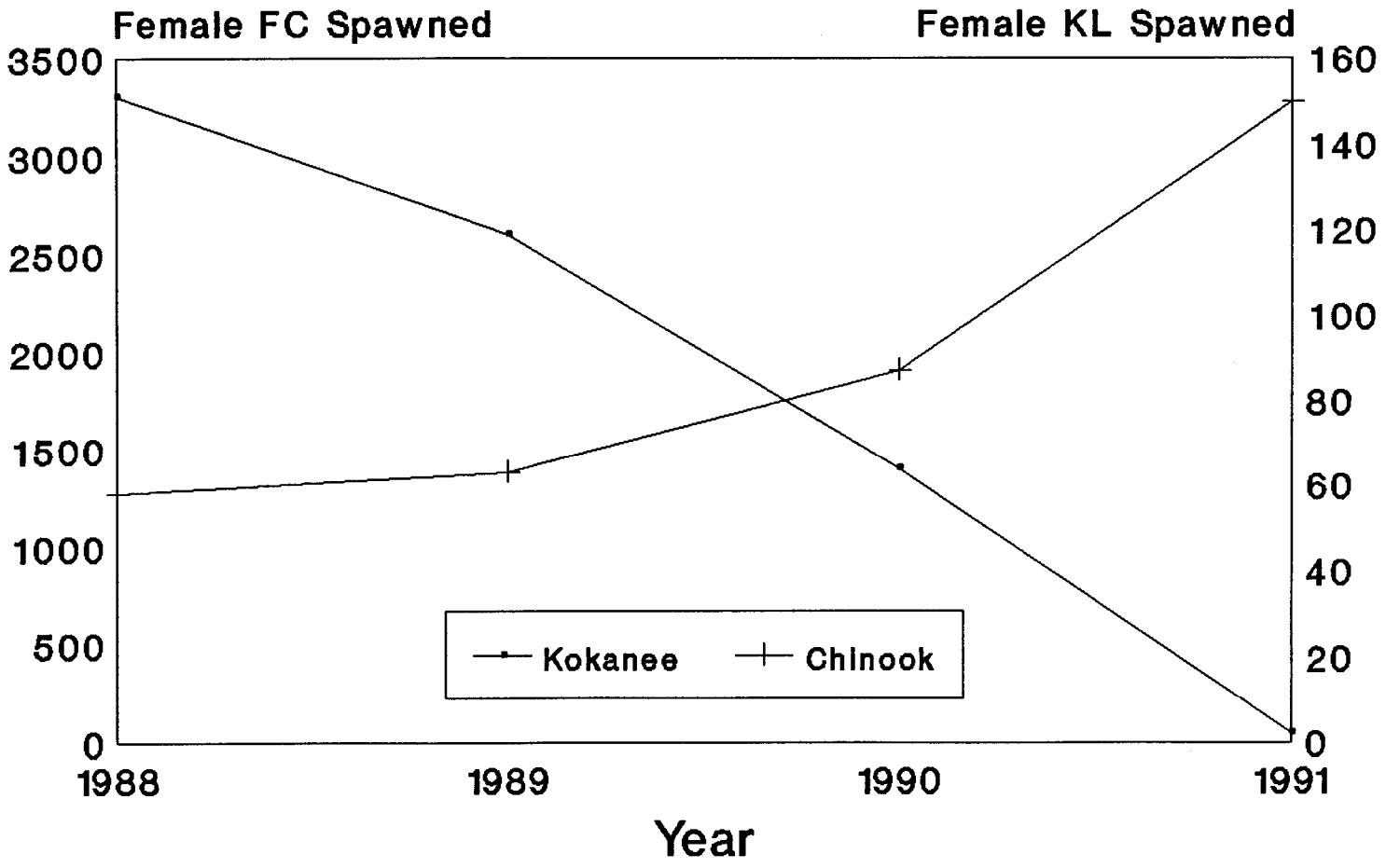

Fig. 2. Chinook and kokanee trends.

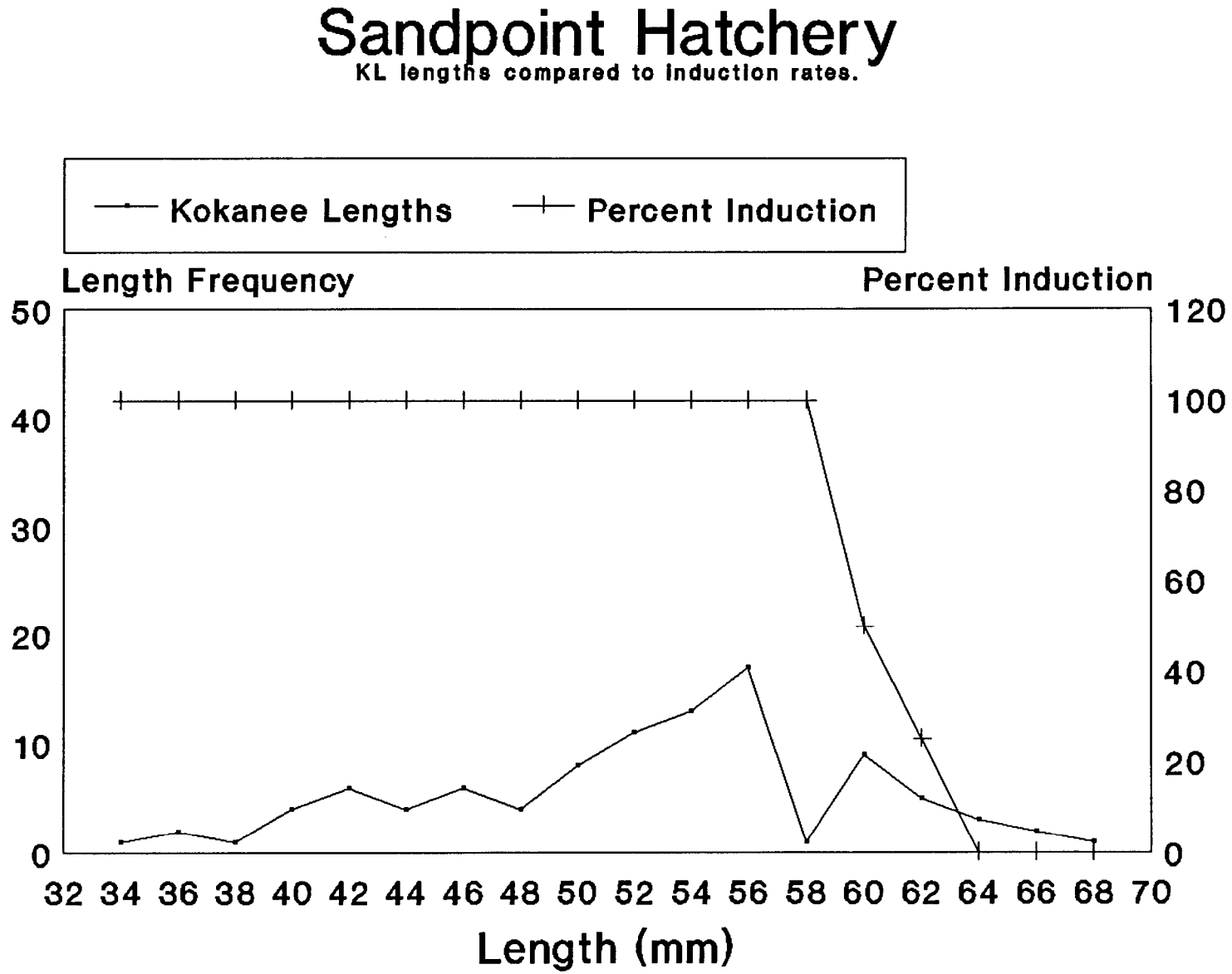

Fig. 3. KL lengths and induction rates.

Sandpoint Hatchery
Sturgeon mortaltiy

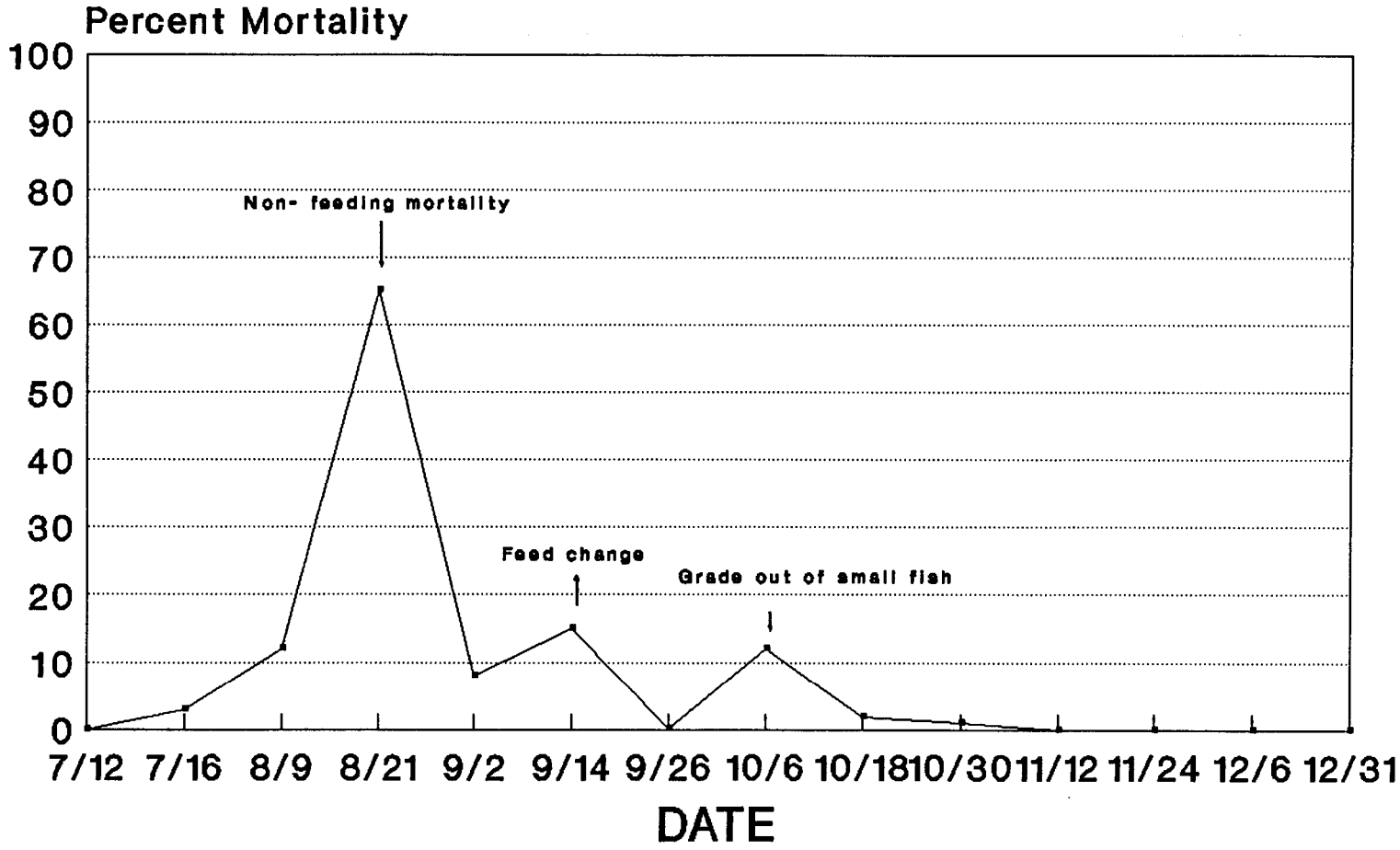

Fig. 4. Kootenai sturgeon mortality.